

Priority (#1)

Access DB# HL64

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Sin J. Lee Examiner #: 76060 Date: 2-23-'05  
Art Unit: 1752 Phone Number 302-1333 Serial Number: 101080, 507  
Mail Box and Bldg/Room Location: 9D66 Results Format Preferred (circle): PAPER DISK E-MAIL

*(Rem.)*  
If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Plz see B-6

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Plz. Search for the copolymer made from  
[ the monomer of <Formula 4> of Cl. #1  
the monomer (b) (see Cl. #1)  
and the monomer of maleic anhydride.

SCIENTIFIC REFERENCE BR  
Sci & Tech Inf. Ctr

FEB 25 REC'D

Pat. & T.M. Office

## STAFF USE ONLY

Searcher: EL  
Searcher Phone #: \_\_\_\_\_  
Searcher Location: \_\_\_\_\_  
Date Searcher Picked Up: 3-4-05  
Date Completed: 3-4-05  
Searcher Prep & Review Time: \_\_\_\_\_  
Clerical Prep Time: \_\_\_\_\_  
Online Time: \_\_\_\_\_

### Type of Search

NA Sequence (#) \_\_\_\_\_  
AA Sequence (#) \_\_\_\_\_  
Structure (#) \_\_\_\_\_  
Bibliographic \_\_\_\_\_  
Litigation \_\_\_\_\_  
Fulltext \_\_\_\_\_  
Patent Family \_\_\_\_\_  
Other \_\_\_\_\_

### Vendors and cost where applicable.

STN \_\_\_\_\_  
Dialog \_\_\_\_\_  
Questel/Orbit \_\_\_\_\_  
Dr.Link \_\_\_\_\_  
Lexis/Nexis \_\_\_\_\_  
Sequence Systems \_\_\_\_\_  
WWW/Internet \_\_\_\_\_  
Other (specify) \_\_\_\_\_

**Amendments to the Claims:**

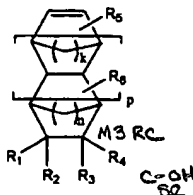
This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A photoresist copolymer derived from a mixture of monomers **consisting essentially of comprising:**

(a) two or more alicyclic olefin derivatives, **each having of** the formula:

<Chemical Formula 4>



wherein

k and n is independently 1 or 2;

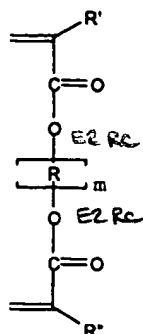
p is an integer from 0 to 5;

R<sub>5</sub> and R<sub>6</sub> are independently hydrogen or methyl; and

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> individually represent hydrogen, straight or branched C<sub>1-10</sub> alkyl, straight or branched C<sub>1-10</sub> ester, straight or branched C<sub>1-10</sub> ketone, straight or branched C<sub>1-10</sub> carboxylic acid, straight or branched C<sub>1-10</sub> acetal, straight or branched C<sub>1-10</sub> alkyl including at least one hydroxyl group, straight or branched C<sub>1-10</sub> ester including at least one hydroxyl group, straight or branched C<sub>1-10</sub> ketone including at least one hydroxyl group, straight or branched C<sub>1-10</sub> carboxylic acid including at least one hydroxyl group, and straight or branched C<sub>1-10</sub> acetal including at least one hydroxyl group,

wherein, all of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> do not represent hydrogen at the same time and at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> represent straight or branched C<sub>1-10</sub> ester including at least one hydroxyl group, straight or branched C<sub>1-10</sub> ketone including at least one hydroxyl group, straight or branched C<sub>1-10</sub> carboxylic group including at least one hydroxyl group, straight or branched C<sub>1-10</sub> acetal including at least one hydroxyl group; and

(b) a cross-linking monomer of the formula:



wherein

each of R' and R'' is independently hydrogen or methyl;

m is an integer from 1 to 10; and

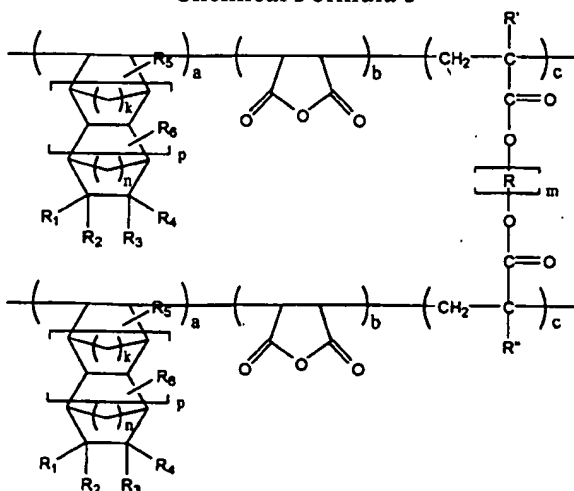
R is straight or branched C<sub>1-10</sub> alkyl, optionally comprising an ester, a ketone, a carboxylic acid, an acetal, a hydroxyl group or a combination thereof; and

(c) maleic anhydride.

2. (Canceled).

3. (Original) The photoresist copolymer according to claim 1 of the formula:

<Chemical Formula 5>



wherein

k, m, n, p, R, R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R', and R'' are those defined in Claim 1; and the ratio a : b :

c is 1-50 mol% : 10-50 mol% : 0.1-20 mol%.



## UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

## \*BIBDATASHEET\*

Bib Data Sheet

CONFIRMATION NO. 1185

SERIAL NUMBER 10/080,507	FILING DATE 02/22/2002	CLASS 430	GROUP ART UNIT 1752	ATTORNEY DOCKET NO. 00939B-068710US
RULE				

## APPLICANTS

Jae Chang Jung, Ichon-shi, KOREA, REPUBLIC OF;

Keun Kyu Kong, Ichon-shi, KOREA, REPUBLIC OF;

Min Ho Jung, Ichon-shi, KOREA, REPUBLIC OF; Geun Su Lee, Ichon-shi, KOREA, REPUBLIC OF;

Ki Ho Baik, Ichon-shi, KOREA, REPUBLIC OF;

## \*\* CONTINUING DATA \*\*

This application is a CIP of 09/465,111 12/16/1999 ABN

SJL

## \*\* FOREIGN APPLICATIONS \*\*

REPUBLIC OF KOREA 98-63793 12/31/1998

SJL

IF REQUIRED, FOREIGN FILING LICENSE GRANTED

\*\* 04/11/2002

Foreign Priority claimed <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	STATE OR	SHEETS	TOTAL	INDEPENDENT
35 USC 119 (a-d) conditions met <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after	COUNTRY	DRAWING	CLAIMS	CLAIMS
Verified and Acknowledged <i>Geun Su Lee</i> SJL	KOREA, REPUBLIC OF	2	19	2
Examiner's Signature Initials				

## ADDRESS

20350

TOWNSEND AND TOWNSEND AND CREW, LLP

TWO EMBARCADERO CENTER

EIGHTH FLOOR

SAN FRANCISCO, CA

94111-3834

## TITLE

Cross-linking monomers for photoresist, and process for preparing photoresist polymers using the same

☐ All Fees

h e e e e c e c e b h e c b

=> file reg  
FILE 'REGISTRY' ENTERED AT 15:28:59 ON 04 MAR 2005  
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L1 STR  
L2 STR  
L3 STR

FILE 'REGISTRY' ENTERED AT 12:53:25 ON 04 MAR 2005  
L4 SCR 2043  
L5 4 S L1 AND L2 AND L3 AND L4  
L6 100 S L1 AND L2 AND L3 AND L4 FUL  
SAV L6 LEE507/A

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L7 0 S L6

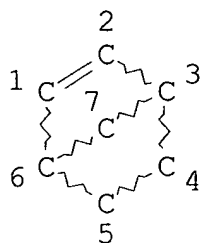
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L8 62 S L7

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L10 1 S L9 SSS SAM SUB=L6  
L11 14 S L9 SSS FUL SUB=L6  
SAV L11 LEE507A/A

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L12 6 S L11

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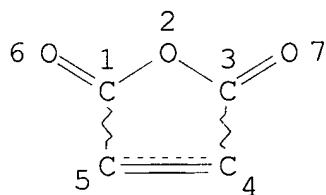
=> d l11 que stat  
L1 STR



NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
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 NUMBER OF NODES IS 7

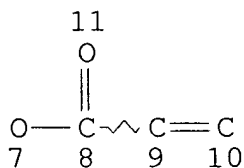
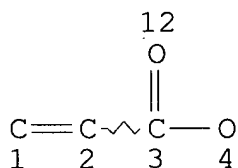
STEREO ATTRIBUTES: NONE  
 L2 STR



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 DEFAULT ECLEVEL IS LIMITED

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 NUMBER OF NODES IS 7

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 L3 STR

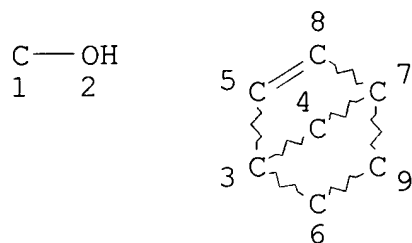


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NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE  
L4 SCR 2043  
L6 100 SEA FILE=REGISTRY SSS FUL L1 AND L2 AND L3 AND L4  
L9 STR



NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE  
L11 14 SEA FILE=REGISTRY SUB=L6 SSS FUL L9

100.0% PROCESSED 100 ITERATIONS  
SEARCH TIME: 00.00.01

14 ANSWERS

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=> d l12 1-6 all hitstr

L12 ANSWER 1 OF 6 ZCA COPYRIGHT 2005 ACS on STN  
AN 138:9661 ZCA

ED Entered STN: 26 Dec 2002  
 TI Cross-linking monomers for photoresists and preparation of  
 photoresist polymers  
 IN Jung, Jae Chang; Kong, Keun Kyu; Jung, Min Ho; Lee, Geun Su; Baik,  
 Ki Ho  
 PA Hyundai Electronics Industries Co., Ltd., S. Korea  
 SO U.S. Pat. Appl. Publ., 10 pp., Cont.-in-part of U.S. Ser. No.  
 465,111, abandoned.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM G03F007-038  
 ICS G03F007-38; G03F007-40; G03F007-32; G03F007-30  
 NCL 430270100; 430910000; 430914000; 430325000; 430326000; 430319000;  
 560224000; 526272000; 526281000; 526323200  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 38  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	US 2002177069	A1	20021128	US 2002-80507	20020222
	KR 2000047041	A	20000725	KR 1998-63793	19981231
PRAI	KR 1998-63793	A	19981231		
	US 1999-465111	B2	19991216		

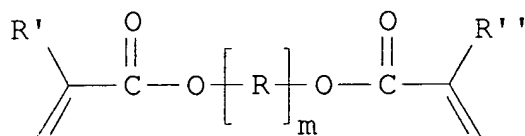
## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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US 2002177069	ICM	G03F007-038
	ICS	G03F007-38; G03F007-40; G03F007-32; G03F007-30
	NCL	430270100; 430910000; 430914000; 430325000; 430326000; 430319000; 560224000; 526272000; 526281000; 526323200
US 2002177069	ECLA	C07C069/54; C08F022/10B; G03F007/039

GI

Applicant's





I

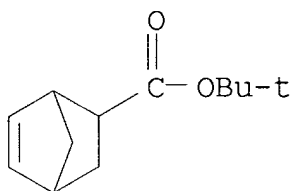
- AB The present invention discloses a crosslinking monomer represented by the general formula I (R1, R2 = H, CH3; m = 1-10; R = C1-10-alkyl, C1-10-ester, C1-10-ketone, C1-10-carboxylic acid, C1-10-acetal, C1-10 alkyl) and a process for prepg. a photoresist polymer using the crosslinking monomer, and a photoresist polymer. The object of the present invention is to provide a crosslinking monomer for a photoresist polymer which can noticeably improve the polymn. yield of the photoresist polymer. Another object of the present invention is to provide a process for prepg. a photoresist polymer using said crosslinking monomer, and a photoresist polymer.
- ST photoresist UV crosslinking monomer copolymer prepn photolithog
- IT Photolithography
- Photoresists
- (UV; crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT **282529-66-2P 282529-67-3P**
- (crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT 75-59-2, Tetramethylammonium hydroxide
- (developer; crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT 66003-78-9, Triphenylsulfonium triflate
- (photoacid generator; crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT 78-67-1, 2,2'-Azobisisobutyronitrile
- (photoinitiator; crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT 109-99-9, Tetrahydrofuran., uses
- (polymn. solvent; crosslinking monomers for photoresists and prepn. of photoresist polymers)
- IT **282529-66-2P 282529-67-3P**
- (crosslinking monomers for photoresists and prepn. of photoresist polymers)
- RN 282529-66-2 ZCA
- CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate,

2,5-furandione, 2-hydroxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate and 1-methyl-1,3-propanediyl di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 154970-45-3

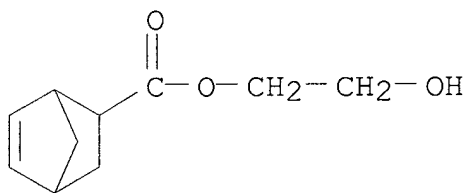
CMF C12 H18 O2



CM 2

CRN 37503-42-7

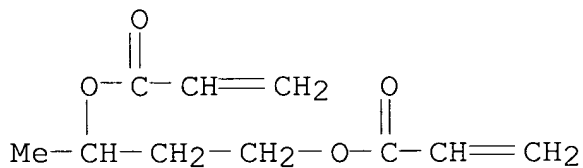
CMF C10 H14 O3



CM 3

CRN 19485-03-1

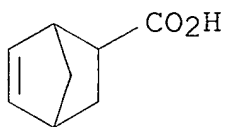
CMF C10 H14 O4



CM 4

CRN 120-74-1

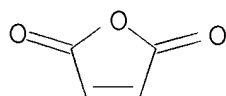
CMF C8 H10 O2



CM 5

CRN 108-31-6

CMF C4 H2 O3



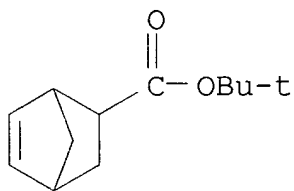
RN 282529-67-3 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with  
1,4-butanediyl di-2-propenoate, 1,1-dimethylethyl  
bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,5-furandione and  
2-hydroxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA  
INDEX NAME)

CM 1

CRN 154970-45-3

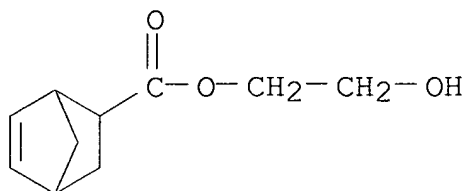
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CM 2

CRN 37503-42-7

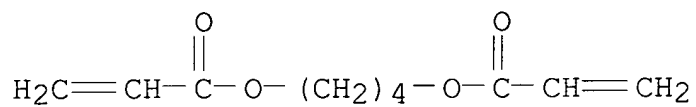
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CRN 1070-70-8

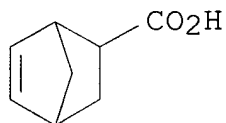
CMF C10 H14 O4



CM 4

CRN 120-74-1

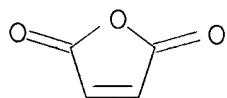
CMF C8 H10 O2



CM 5

CRN 108-31-6

CMF C4 H2 O3



L12 ANSWER 2 OF 6 ZCA COPYRIGHT 2005 ACS on STN

AN 135:203003 ZCA

ED Entered STN: 20 Sep 2001

TI Photoresist monomer, photoresist polymer, manufacture of the

polymer, photoresist composition, patterning of photoresist, and semiconductor device manufactured by using the photoresist pattern

IN Lee, Keun Soo; Jung, Jae Chang; Jung, Min Ho; Paek, Ki Ho  
 PA Hynix Semiconductor, S. Korea  
 SO Jpn. Kokai Tokkyo Koho, 24 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC C08F230-08; C07F007-18; C08F002-48; C08F220-20; C08F222-06;  
 C08F232-00; C08F232-04; C08K005-00; C08L033-04; C08L035-00;  
 C08L043-04; C08L045-00; G03F007-039; G03F007-075; G03F007-11;  
 G03F007-26; H01L021-027  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2001233920	A2	20010828	JP 2001-42125	20010219
	KR 2001081753	A	20010829	KR 2000-7853	20000218
	US 2001031420	A1	20011018	US 2001-788181	20010215
	US 5589707	B2	20030708		
	TW 550436	B	20030901	TW 2001-90103512	20010216
	US 2003207205	A1	20031106	US 2003-436742	20030512
	US 6811960	B2	20041102		
PRAI	KR 2000-7853	A	20000218		
	US 2001-788181	A3	20010215		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES		
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JP 2001233920	IC	C08F230-08IC	C07F007-18IC	C08F002-48IC
		C08F220-20IC	C08F222-06IC	C08F232-00IC
		C08F232-04IC	C08K005-00IC	C08L033-04IC
		C08L035-00IC	C08L043-04IC	C08L045-00IC
		G03F007-039IC	G03F007-075IC	G03F007-11IC
		G03F007-26IC	H01L021-027	
US 2001031420	ECLA	C07F007/18C6; C07F007/18C4D; C08F030/08;		

US 2003207205 ECLA G03F007/004D; G03F007/039; G03F007/075M2  
 GI C07F007/18C4D; C07F007/18C6; C08F030/08;  
 G03F007/004D; G03F007/039; G03F007/075M2

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The monomer for photoresist is  $\text{CH}_2:\text{CR}_5\text{CO}_2(\text{CH}_2)_n\text{OX}$  (X = cyclic silyl group Q; R1-R4 = H, C1-10 linear or branched alkyl which may be inserted with O), I, or II (X1, X2, Y1, Y2 =  $\text{CH}_2$ ,  $\text{CH}_2\text{CH}_2$ ; R5 = H, Me; s, t = 0-2; n = 1-5). The photoresist polymer is that involving .gtoreq.1 of the above monomers and the polymer is manufd. by mixing the monomers and polymg. in the presence of a polymn. initiator. The photoresist compn. contains the polymer, a photosensitive acid-generating agent, and an org. solvent. The compn. is applied on a substrate, exposed, and developed to give the pattern which is used in semiconductor device fabrication. The photoresist compn. is suitable for bilayer resist and the photoresist polymer involving Si shows good O2 plasma etching resistance.

ST photoresist cyclic silyl monomer polymer; alicyclic monomer polymer photoresist; bilayer photoresist semiconductor device fabrication; etching resistance photoresist polymer

IT Photolithography  
 (of polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)

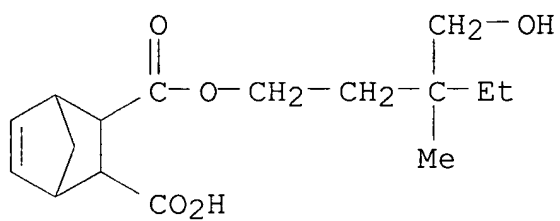
IT Etching  
 (plasma, resistance; of polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)

IT Photoresists  
 Semiconductor device fabrication  
 (polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)

IT Ligroine  
 (solvent; for prepn. of photoresist compn. contg. polymer involving cyclic silane or alicyclic group)

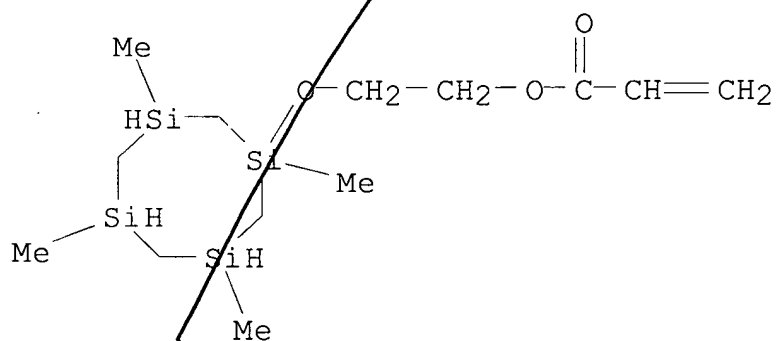
IT 52754-92-4, Diphenyliodonium hexafluoroantimonate 57835-99-1, Triphenylsulfonium hexafluorophosphate 57840-38-7, Triphenylsulfonium hexafluoroantimonate 57900-42-2, Triphenylsulfonium hexafluoroarsenate 58109-40-3, Diphenyliodonium hexafluorophosphate 62613-15-4, Diphenyliodonium hexafluoroarsenate 66003-78-9, Triphenylsulfonium triflate 81416-37-7 116808-67-4, Diphenyl-p-methoxyphenylsulfonium triflate 145612-66-4 195245-87-5 255056-42-9  
 (acid-generating agent; polymer involving cyclic silane or

- alicyclic group for bilayer photoresist for semiconductor device fabrication)
- IT 818-61-1, 2-Hydroxyethyl acrylate 2370-88-9, 2,4,6,8-Tetramethylcyclotetrasiloxane 37503-42-7, 2-Hydroxyethyl 5-norbornene-2-carboxylate  
(monomer from; polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)
- IT 356043-15-7P 356043-16-8P 356043-17-9P  
(monomer; polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)
- IT 78-67-1, AIBN 94-36-0, Benzoyl peroxide, uses 110-05-4, tert-Butyl peroxide 110-22-5, Acetyl peroxide 2895-03-6, Lauryl peroxide  
(photopolymn. initiator; for prepn. of photoresist polymer involving cyclic silane or alicyclic group)
- IT 356043-19-1P 356043-20-4P 356043-21-5P  
(polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)
- IT 60-29-7, Diethyl ether, uses 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropyl alcohol, uses 67-64-1, Acetone, uses 67-66-3, Chloroform, uses 67-68-5, DMSO, uses 68-12-2, DMF, uses 71-23-8, Propanol, uses 71-43-2, Benzene, uses 78-93-3, Ethyl methyl ketone, uses 108-88-3, Toluene, uses 109-99-9, THF, uses 110-54-3, Hexane, uses 110-82-7, Cyclohexane, uses 123-91-1, Dioxane, uses 141-78-6, Ethyl acetate, uses 1330-20-7, Xylene, uses  
(solvent; for prepn. of photoresist compn. contg. polymer involving cyclic silane or alicyclic group)
- IT 108-94-1, Cyclohexanone, uses 120-92-3, Cyclopentanone 763-69-9, Ethyl 3-ethoxypropionate 84540-57-8, Propylene glycol methyl ether acetate  
(solvent; polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)
- IT 356043-19-1P 356043-20-4P 356043-21-5P  
(polymer involving cyclic silane or alicyclic group for bilayer photoresist for semiconductor device fabrication)
- RN 356043-19-1 ZCA
- CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[3-(hydroxymethyl)-3-methylpentyl] ester, polymer with 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,2-dimethyl-1,3-propanediyl di-2-propenoate, 2,5-furandione and 2-[(1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooct-1-yl)oxy]ethyl 2-propenoate (9CI) (CA INDEX NAME)
- CM 1
- CRN 356043-18-0
- CMF C16 H24 O5



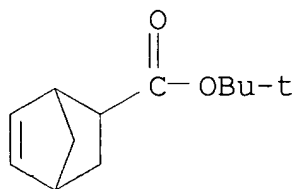
CM 2

CRN 356043-15-7  
 CMF C13 H30 O3 Si4



CM 3

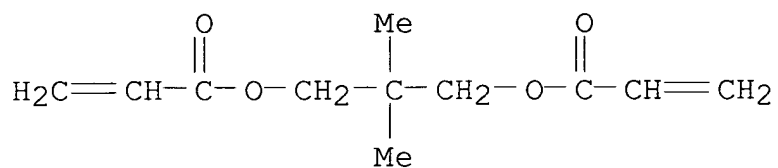
CRN 154970-45-3  
 CMF C12 H18 O2



CM 4

CRN 2223-82-7  
 CMF C11 H16 O4

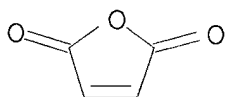




CM 5

CRN 108-31-6

CMF C4 H2 O3



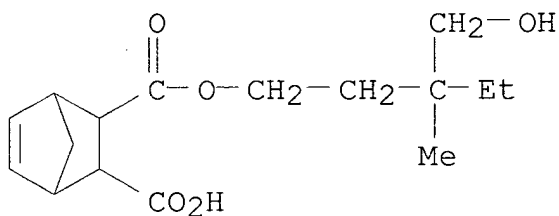
RN 356043-20-4 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[3-(hydroxymethyl)-3-methylpentyl] ester, polymer with 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,5-furandione, 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate and 2-[(1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooct-1-yl)oxy]ethyl 2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 356043-18-0

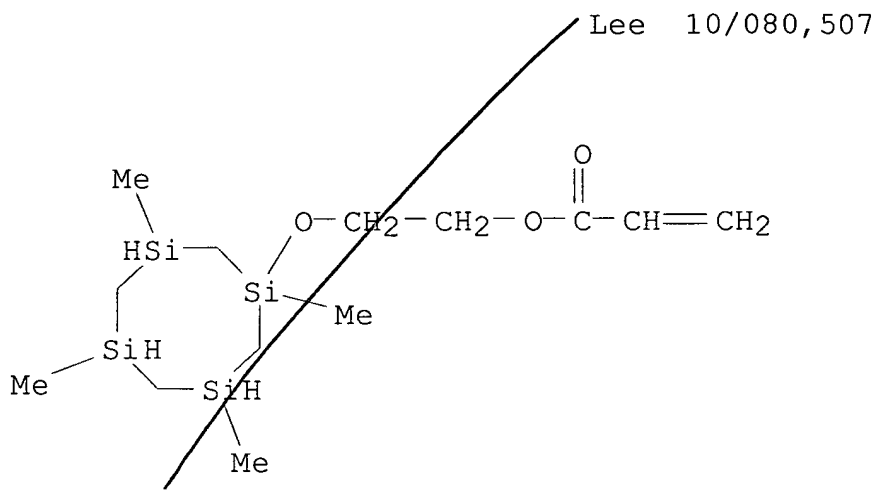
CMF C16 H24 O5



CM 2

CRN 356043-15-7

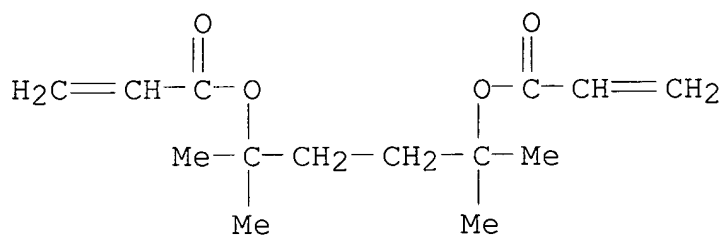
CMF C13 H30 O3 Si4



CM 3

CRN 188837-15-2

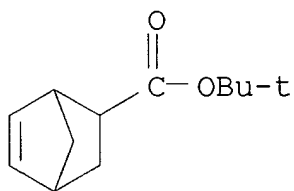
CMF C14 H22 O4



CM 4

CRN 154970-45-3

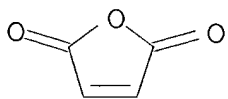
CMF C12 H18 O2



CM 5

CRN 108-31-6

CMF C4 H2 O3

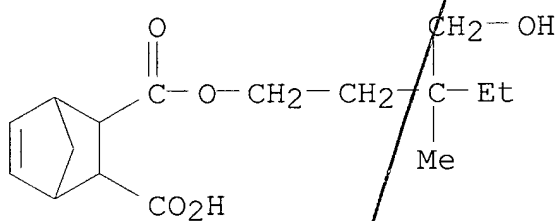


RN 356043-21-5 ZCA  
 CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[3-(hydroxymethyl)-3-methylpentyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1-(bicyclo[2.2.1]hept-5-en-2-ylmethoxy)-1,3,5,7-tetramethyl-1,3,5,7-tetrasilacyclooctane, 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,5-furandione and 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 356043-18-0

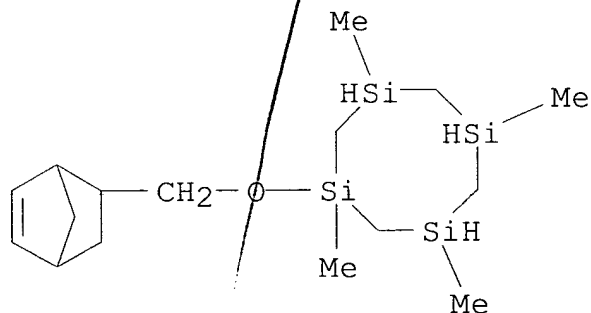
CMF C16 H24 O5



CM 2

CRN 356043-17-9

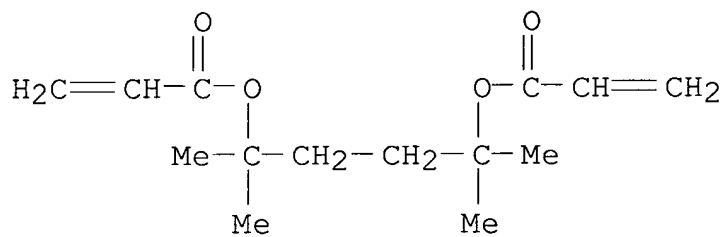
CMF C16 H34 O Si4



CM 3

CRN 188837-15-2

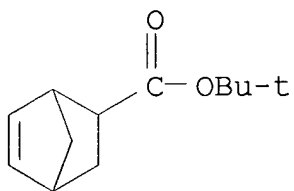
CMF C14 H22 O4



CM 4

CRN 154970-45-3

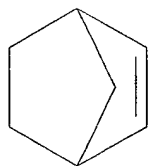
CMF C12 H18 O2



CM 5

CRN 498-66-8

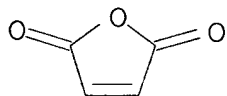
CMF C7 H10



CM 6

CRN 108-31-6

CMF C4 H2 O3



L12 ANSWER 3 OF 6 ZCA COPYRIGHT 2005 ACS on STN  
 AN 134:245232 ZCA  
 ED Entered STN: 12 Apr 2001  
 TI Radiation-sensitive resin composition as chemically-amplified  
 photoresist with superior dry etching resistance and resolution for  
 deep UV lithography  
 IN Douki, Katsuji; Murata, Kiyoshi; Ishii, Hiroyuki; Kajita, Toru;  
 Shimokawa, Tsutomu  
 PA JSR Corporation, Japan  
 SO Eur. Pat. Appl., 52 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
 Other Reprographic Processes)  
 Section cross-reference(s): 38  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1085379	A1	20010321	EP 2000-120000	20000914
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001109157	A2	20010420	JP 1999-291291	19991013
JP 2001209181	A2	20010803	JP 2000-277966	20000913
US 6482568	B1	20021119	US 2000-662160	20000914
PRAI JP 1999-264110	A	19990917		
JP 1999-291291	A	19991013		
JP 1999-325222	A	19991116		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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EP 1085379 ICM G03F007-039  
 EP 1085379 ECLA G03F007/039  
 US 6482568 ECLA G03F007/039  
 GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB A radiation-sensitive resin compn. comprises (a) a resin contg. an acid-dissociable group which is insol. or scarcely sol. in alkali and becomes alkali sol. when the acid-dissociable group dissocs., comprising the following recurring unit I, recurring unit II, and at least one of the recurring units III and IV (A, B = H, C1-4-alkyl; X, Y = H, monovalent O or N contg. polar group, X joining together with Y may form dicarboxylic anhydride group; n = 0-2; R1 = H, CH3; R2 = CR33; R3 = monovalent alicyclic hydrocarbon group having 4-20 carbon atoms, its deriv., C1-4-alkyl; R4 = divalent hydrocarbon group having alicyclic skeleton contg. 3-15 carbons), (b) a photoacid generator, (c) an acid diffusion controller, and (d) alicyclic additive. The radiation-sensitive resin compn. is suitable for use as a chem.-amplified resist showing sensitivity to active radiation such as deep UV rays represented by a KrF excimer laser or ArF excimer laser, exhibiting superior dry etching resistance without being affected by types of etching gas, having high radiation transmittance, exhibiting excellent basic characteristics as a resist such as sensitivity, resolu., and pattern shape, possessing excellent storage stability as a compn., and exhibiting sufficient adhesion to substrates.

ST chem amplified photoresist polymer prepn compn deep UV lithog; dry etching resistance sensitivity resolu chem amplified photoresist polymer

IT Photoresists

(UV; copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

IT 103-76-4, 1-(2-Hydroxyethyl)piperazine 611-36-9,  
 4-Hydroxyquinoline 1116-76-3, Tri-n-octylamine 3033-62-3,  
 Bis(2-dimethylaminoethyl)ether 7560-83-0, Methyldicyclohexylamine  
 193810-83-2 330576-56-2

(acid diffusion controller; copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

IT 330576-37-9P 330576-38-0P **330576-39-1P** 330576-41-5P  
 330576-42-6P 330576-43-7P 330576-44-8P 330576-46-0P  
 330576-47-1P 330576-48-2P 330576-49-3P 330576-51-7P  
 330576-52-8P 330576-54-0P 330576-55-1P

(copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

IT 498-66-8D, Bicyclo[2.2.1]hept-2-ene, imide derivs. 66003-78-9,  
Triphenylsulfonium trifluoromethanesulfonate 144317-44-2,  
Triphenylsulfonium nonafluoro-n-butanesulfonate 194999-85-4  
209482-18-8 330576-58-4

(photoacid generator; copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

IT 157692-53-0, tert-Butyl deoxycholate 169228-97-1 231296-44-9,  
t-Butoxycarbonylmethyl deoxycholate

(resist additive; copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) JSR Corp; EP 1048983 A 2000 ZCA
- (2) Jsr Corp; EP 0930541 A 1999 ZCA
- (3) Lucent Technologies Inc; EP 0794458 A 1997 ZCA
- (4) Samsung Electronics Co Ltd; EP 0836119 A 1998 ZCA
- (5) Samsung Electronics Co Ltd; EP 0921439 A 1999 ZCA

IT 330576-39-1P

(copolymer compns. as chem.-amplified photoresist with superior dry etching resistance, sensitivity and resolu. properties for deep UV lithog.)

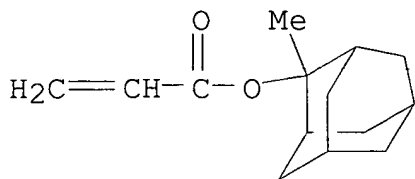
RN 330576-39-1 ZCA

CN 2-Propenoic acid, 1,1,4,4-tetramethyl-1,4-butanediyl ester, polymer  
with 2,5-furandione, 2-methyltricyclo[3.3.1.1<sup>3,7</sup>]dec-2-yl  
2-propenoate and 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-1,4:5,8-  
dimethanonaphthalene-2-methanol (9CI) (CA INDEX NAME)

CM 1

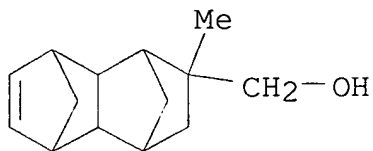
CRN 249562-06-9

CMF C14 H20 O2



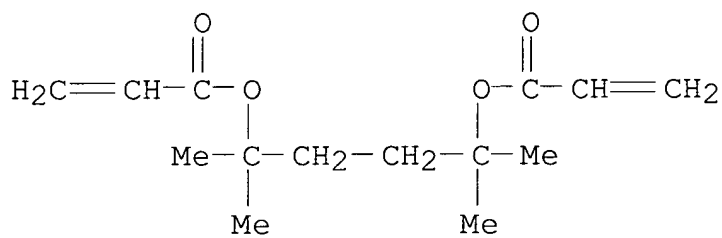
CM 2

CRN 231296-21-2  
CMF C14 H20 O



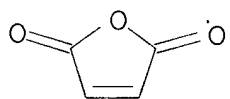
CM 3

CRN 188837-15-2  
CMF C14 H22 O4



CM 4

CRN 108-31-6  
CMF C4 H2 O3



L12 ANSWER 4 OF 6 ZCA COPYRIGHT 2005 ACS on STN  
AN 134:200535 ZCA  
ED Entered STN: 22 Mar 2001  
TI Crosslinking monomer containing double bond and photoresist  
copolymer containing the same  
IN Lee, Geun Su; Jung, Jae Chang; Baik, Ki Ho  
PA Hyundai Electronics Industries Co., Ltd., Ichon, S. Korea  
SO Ger. Offen., 16 pp.  
CODEN: GWXXBX  
DT Patent  
LA German



IC ICM G03F007-039  
ICS C08J007-12

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)  
Section cross-reference(s): 38, 76

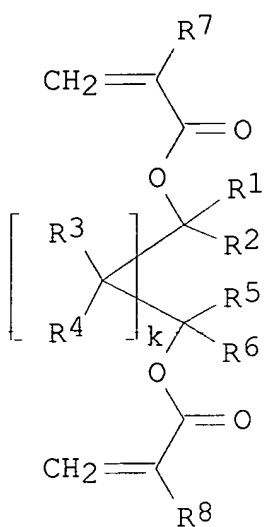
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10040963	A1	20010301	DE 2000-10040963	20000822
	KR 2001018905	A	20010315	KR 1999-35046	19990823
	GB 2354004	A1	20010314	GB 2000-19436	20000809
	GB 2354004	B2	20040114		
	JP 2001106737	A2	20010417	JP 2000-252762	20000823
PRAI	KR 1999-35046	A	19990823		

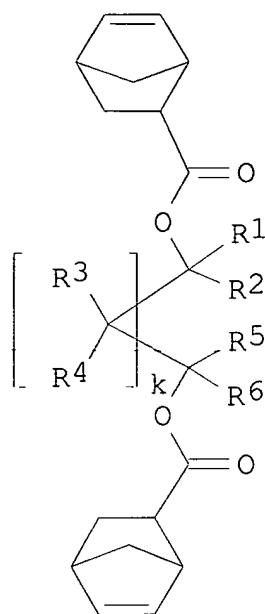
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 10040963	ICM	G03F007-039
	ICS	C08J007-12
DE 10040963	ECLA	G03F007/004D; G03F007/039
GB 2354004	ECLA	G03F007/004D; G03F007/039

GI



I



II

AB The photoresist copolymer includes a crosslinking monomer represented by I or II (R1-8 = H, C1-5-alkyl; k = 0-3), and at least one another suitable photoresist monomer. The crosslinking monomer may be selected from 2,5-hexanediol diacrylate, 2,5-hexanediol dimethacrylate, 2,4-pentanediol diacrylate, 2,4-pentanediol dimethacrylate, neopentylglycol diacrylate, and neopentylglycol dimethacrylate. The photoresist copolymer is prepd. and the photoresist compn. is also prepd. The photoresist compn. is sensitive to ArF-, KrF-, VUV-, EUV-light-sources, electron-beam, x-ray, or ion-beam.

ST crosslinking monomer photoresist polymer compn prepn

IT Crosslinking agents

Electron beam resists

Ion beam resists

Photoresists

X-ray resists

(crosslinking monomer contg. double bond and photoresist copolymer contg. the same)

IT Ligroine

(prepn. of photoresist copolymer contg. crosslinking monomer with double bond)

IT 1985-51-9 2223-82-7 85996-28-7, 2,5-Hexanediol diacrylate  
86336-50-7, 2,5-Hexanediol dimethacrylate 184223-36-7,  
2,4-Pentanediol diacrylate 328067-99-8, 2,4-Pentanediol  
dimethacrylate

(crosslinking monomer contg. double bond for photoresist

- copolymer)
- IT 763-69-9, Ethyl-3-ethoxypropionate  
(in photoresist compn. including photoresist copolymer contg.  
crosslinking monomer with double bond)
- IT 66003-78-9, Triphenylsulfoniumtriflate  
(photoacid generator in photoresist compn. including photoresist  
copolymer contg. crosslinking monomer with double bond)
- IT 78-67-1, AIBN  
(prepn. of photoresist copolymer contg. crosslinking monomer with  
double bond)
- IT 60-29-7, Diethyl ether, uses  
(prepn. of photoresist copolymer contg. crosslinking monomer with  
double bond)
- IT **328068-00-4P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-  
[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-2,5-hexanediol diacrylate copolymer **328068-01-5P**  
, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-[2.2.1]-hept-5-ene-2,3-  
dicarboxylate-maleic acid anhydride-norbornene-tert-butylbicyclo-  
[2.2.1]-hept-5-ene-2-carboxylate-2,4-pentanediol diacrylate  
copolymer **328068-02-6P**, Mono-2-ethyl-2-(hydroxymethyl)-  
butylbicyclo-[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-neopentyl glycol diacrylate copolymer  
**328068-03-7P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-  
[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-2,5-hexanediol dimethacrylate copolymer  
**328068-04-8P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-  
[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-2,4-pentanediol dimethacrylate copolymer  
**328068-05-9P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-  
[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-neopentyl glycol dimethacrylate copolymer  
(prepn. of photoresist copolymer contg. crosslinking monomer with  
double bond)
- IT **328068-00-4P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-  
[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-  
carboxylate-2,5-hexanediol diacrylate copolymer **328068-01-5P**  
, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-[2.2.1]-hept-5-ene-2,3-  
dicarboxylate-maleic acid anhydride-norbornene-tert-butylbicyclo-  
[2.2.1]-hept-5-ene-2-carboxylate-2,4-pentanediol diacrylate  
copolymer **328068-02-6P**, Mono-2-ethyl-2-(hydroxymethyl)-  
butylbicyclo-[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid  
anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-

carboxylate-neopentyl glycol diacrylate copolymer

**328068-03-7P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-carboxylate-2,5-hexanediol dimethacrylate copolymer

**328068-04-8P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-carboxylate-2,4-pentanediol dimethacrylate copolymer

**328068-05-9P**, Mono-2-ethyl-2-(hydroxymethyl)-butylbicyclo-[2.2.1]-hept-5-ene-2,3-dicarboxylate-maleic acid anhydride-norbornene-tert-butylbicyclo-[2.2.1]-hept-5-ene-2-carboxylate-neopentyl glycol dimethacrylate copolymer

(prepn. of photoresist copolymer contg. crosslinking monomer with double bond)

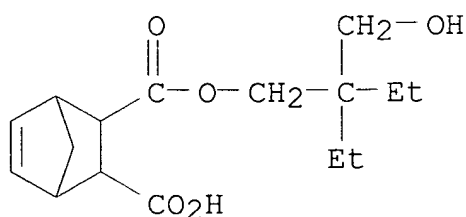
RN 328068-00-4 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1,4-dimethyl-1,4-butanediyl di-2-propenoate, 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 250583-69-8

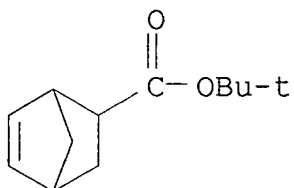
CMF C16 H24 O5



CM 2

CRN 154970-45-3

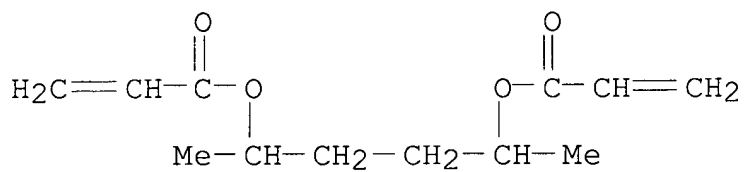
CMF C12 H18 O2



CM 3

CRN 85996-28-7

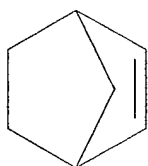
CMF C12 H18 O4



CM 4

CRN 498-66-8

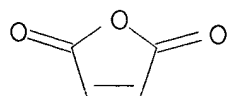
CMF C7 H10



CM 5

CRN 108-31-6

CMF C4 H2 O3



RN 328068-01-5 ZCA

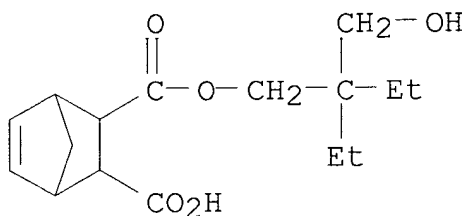
CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-

(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene,  
 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate,  
 1,3-dimethyl-1,3-propanediyl di-2-propenoate and 2,5-furandione  
 (9CI) (CA INDEX NAME)

CM 1

CRN 250583-69-8

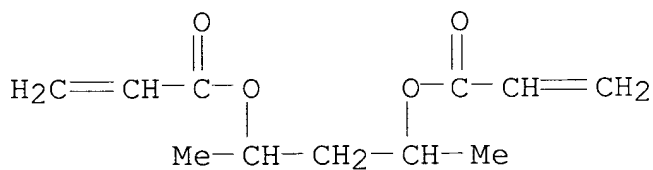
CMF C16 H24 O5



CM 2

CRN 184223-36-7

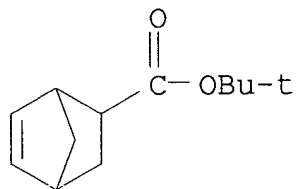
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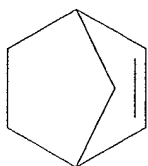
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CMF C12 H18 O2



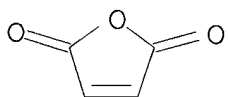
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CRN 498-66-8  
CMF C7 H10



CM 5

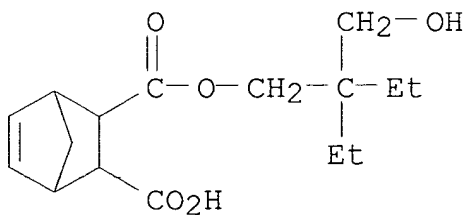
CRN 108-31-6  
CMF C4 H2 O3



RN 328068-02-6 ZCA  
CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,2-dimethyl-1,3-propanediyl di-2-propenoate and 2,5-furandione (9CI) (CA INDEX NAME)

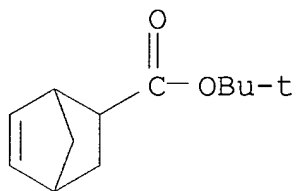
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CRN 250583-69-8  
CMF C16 H24 O5



CM 2

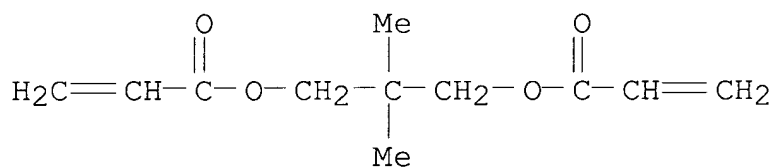
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CM 3

CRN 2223-82-7

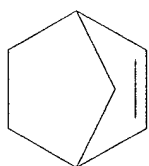
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CM 4

CRN 498-66-8

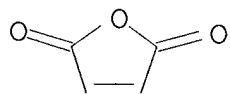
CMF C7 H10



CM 5

CRN 108-31-6

CMF C4 H2 O3



RN 328068-03-7 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-

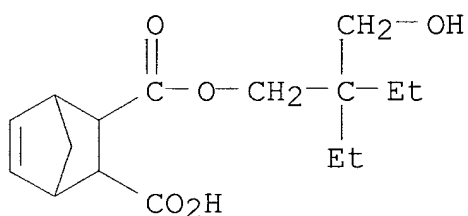


(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1,4-dimethyl-1,4-butanediyl bis(2-methyl-2-propenoate), 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 250583-69-8

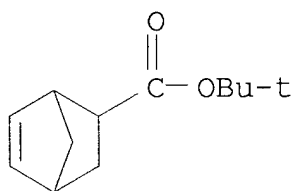
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CM 2

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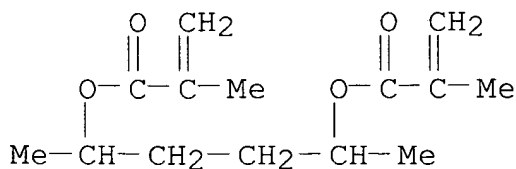
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CM 3

CRN 86336-50-7

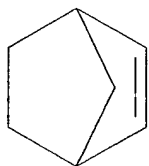
CMF C14 H22 O4



CM 4

CRN 498-66-8

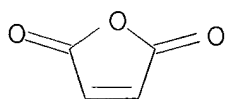
CMF C7 H10



CM 5

CRN 108-31-6

CMF C4 H2 O3



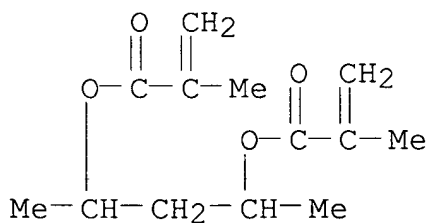
RN 328068-04-8 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 1,3-dimethyl-1,3-propanediyl bis(2-methyl-2-propenoate) and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 328067-99-8

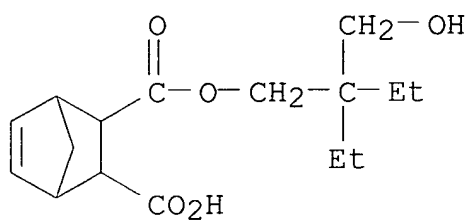
CMF C13 H20 O4



CM 2

CRN 250583-69-8

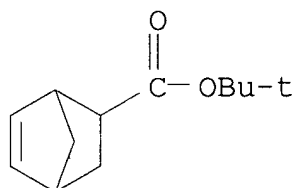
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CM 3

CRN .154970-45-3

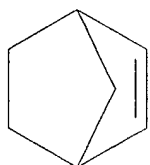
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CM 4

CRN 498-66-8

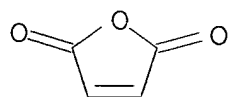
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CM 5

CRN 108-31-6

CMF C4 H2 O3



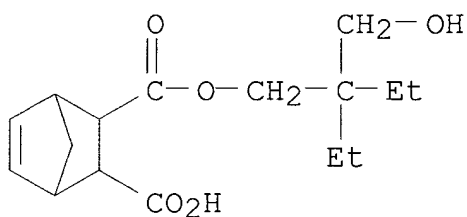
RN 328068-05-9 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, mono[2-ethyl-2-(hydroxymethyl)butyl] ester, polymer with bicyclo[2.2.1]hept-2-ene, 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,2-dimethyl-1,3-propanediyl bis(2-methyl-2-propenoate) and 2,5-furandione (9CI) (CA INDEX NAME)

CM 1

CRN 250583-69-8

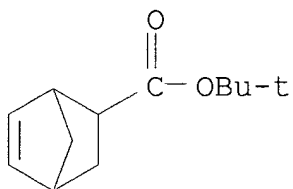
CMF C16 H24 O5



CM 2

CRN 154970-45-3

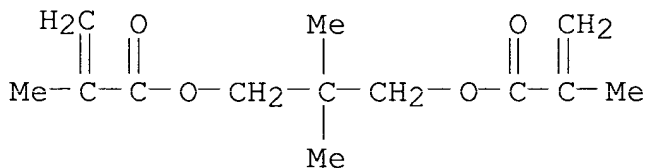
CMF C12 H18 O2



CM 3

CRN 1985-51-9

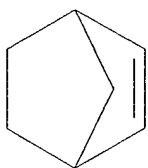
CMF C13 H20 O4



CM 4

CRN 498-66-8

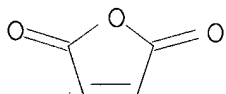
CMF C7 H10



CM 5

CRN 108-31-6

CMF C4 H2 O3



L12 ANSWER 5 OF 6 ZCA COPYRIGHT 2005 ACS on STN  
AN 133:112401 ZCA  
ED Entered STN: 11 Aug 2000  
TI Crosslinking agents and copolymers for photoresists, manufacture of  
photoresist polymers, photoresist compositions, their patterning,  
and semiconductor devices  
IN Chang, Jae Chang; Kong, Keun Kyu; Chung, Min Ho; Lee, Keun soo;  
Paek, Ki Ho  
PA Hyundai Electronics Industries Co., Ltd., S. Korea  
SO Jpn. Kokai Tokkyo Koho, 12 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC ICM G03F007-004  
ICS C08F220-28; C08F222-06; C08F230-00; C08F290-06; G03F007-039  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)  
Section cross-reference(s): 38, 76  
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2000199951	A2	20000718	JP 1999-365146	

				199912 22
KR 2000047041	A	20000725	KR 1998-63793	
				199812 31
GB 2345286	A1	20000705	GB 1999-29650	
				199912 15
GB 2345286	B2	20040630		
DE 19960506	A1	20000907	DE 1999-19960506	
				199912 15
IT 1308679	B1	20020109	IT 1999-TO1137	
				199912 21
NL 1013916	A1	20000703	NL 1999-1013916	
				199912 22
NL 1013916	C2	20021203		
CN 1258670	A	20000705	CN 1999-126687	
				199912 24
FR 2788062	A1	20000707	FR 1999-16643	
				199912 29
FR 2788062	B1	20040910		
PRAI KR 1998-63793	A	19981231		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2000199951	ICM	G03F007-004
	ICS	C08F220-28; C08F222-06; C08F230-00; C08F290-06;
		G03F007-039
GB 2345286	ECLA	C07C069/54; C08F022/10B; G03F007/039
DE 19960506	ECLA	C07C069/54; C08F022/10B; G03F007/039
NL 1013916	ECLA	C07C069/54; C08F022/10B; G03F007/039
FR 2788062	ECLA	C07C069/54; C08F022/10B; G03F007/039

AB Photoresist crosslinking agent CH:CR1CO2RmOCOC(R2):CH (I; R1-2 = H, Me; m = integer of 1-10; R = C1-10 alkyls, esters, ketones, carboxylic acids, or acetals having substitution groups in main or side chains, those contg.  $\text{OH}$  groups) is claimed. Markush structures for preferable copolymers are given. Also claimed are (1) photoresist copolymers comprising of  $\text{OH}$  groups, (2) their prepn. by dissoln. of  $\text{OH}$  groups in an org. solvent, followed by addn. of photopolymn. initiator or catalyst, (3) photoresist compns. comprising of photoresist copolymers and org. solvents, (4) patterning of the compns. for use as etching mask, and (5) manuf. of

semiconductor devices. Photoresist compns. with high polymn. yield are obtained by use of the crosslinking agents.

ST photoresist diacrylate crosslinking agent; acrylate crosslinking agent photoresist compn; methacrylate crosslinking agent photoresist compn; semiconductor device fabrication photoresist patterning etching

IT Crosslinking agents  
Etching  
Photoresists  
Semiconductor device fabrication  
Semiconductor devices  
    (aliph. cyclic olefin copolymers contg. di(meth)acrylate crosslinking agents as photoresists for semiconductor device fabrication)

IT 1070-70-8 19485-03-1  
    (aliph. cyclic olefin copolymers contg. di(meth)acrylate crosslinking agents as photoresists for semiconductor device fabrication)

IT **282529-66-2P 282529-67-3P**  
    (aliph. cyclic olefin copolymers contg. di(meth)acrylate crosslinking agents as photoresists for semiconductor device fabrication)

IT 52754-92-4 57835-99-1 57840-38-7 57900-42-2 58109-40-3  
62613-15-4 66003-78-9 81416-37-7 116808-67-4 154557-16-1  
195245-87-5 255056-42-9  
    (photoacid generator; aliph. cyclic olefin copolymers contg. di(meth)acrylate crosslinking agents as photoresists for semiconductor device fabrication)

IT **282529-66-2P 282529-67-3P**  
    (aliph. cyclic olefin copolymers contg. di(meth)acrylate crosslinking agents as photoresists for semiconductor device fabrication)

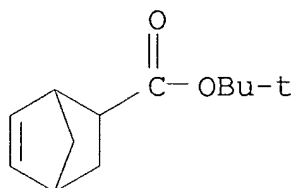
RN 282529-66-2 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with 1,1-dimethylethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,5-furandione, 2-hydroxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate and 1-methyl-1,3-propanediyl di-2-propenoate (9CI) (CA INDEX NAME)

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CRN 154970-45-3

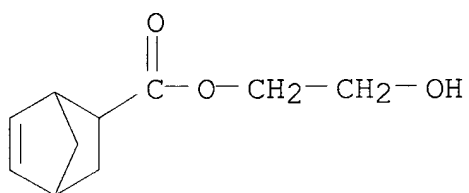
CMF C12 H18 O2



CM 2

CRN 37503-42-7

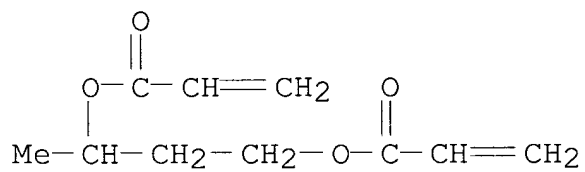
CMF C10 H14 O3



CM 3

CRN 19485-03-1

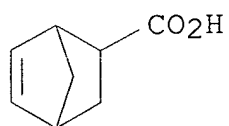
CMF C10 H14 O4



CM 4

CRN 120-74-1

CMF C8 H10 O2

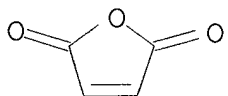




CM 5

CRN 108-31-6

CMF C4 H2 O3



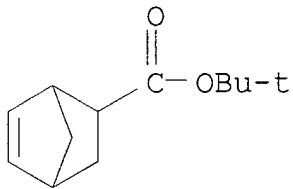
RN 282529-67-3 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, polymer with  
1,4-butanediyl di-2-propenoate, 1,1-dimethylethyl  
bicyclo[2.2.1]hept-5-ene-2-carboxylate, 2,5-furandione and  
2-hydroxyethyl bicyclo[2.2.1]hept-5-ene-2-carboxylate (9CI) (CA  
INDEX NAME)

CM 1

CRN 154970-45-3

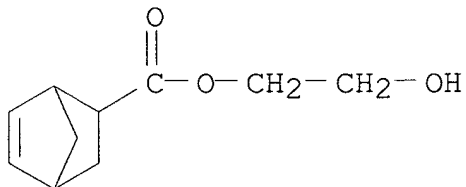
CMF C12 H18 O2



CM 2

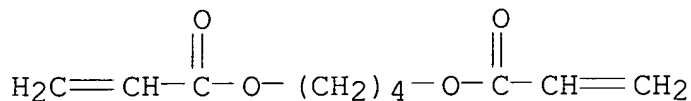
CRN 37503-42-7

CMF C10 H14 O3



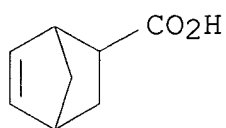
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CRN 1070-70-8  
CMF C10 H14 O4



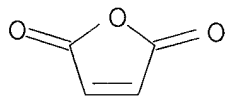
CM 4

CRN 120-74-1  
CMF C8 H10 O2



CM 5

CRN 108-31-6  
CMF C4 H2 O3



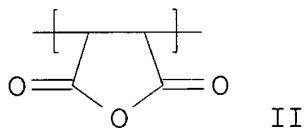
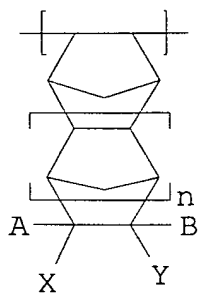
L12 ANSWER 6 OF 6 ZCA COPYRIGHT 2005 ACS on STN  
AN 131:108922 ZCA  
ED Entered STN: 14 Aug 1999  
TI Radiation-sensitive resin composition  
IN Kajita, Toru; Suwa, Mitsuhito; Iwasawa, Haruo; Yamamoto, Masafumi  
PA JSR Corporation, Japan  
SO Eur. Pat. Appl., 49 pp.  
CODEN: EPXXDW  
DT Patent  
LA English  
IC ICM G03F007-039  
ICS G03F007-004  
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and  
Other Reprographic Processes)  
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	EP 930541	A1	19990721	EP 1999-100718	199901 15
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11202491	A2	19990730	JP 1998-18290	199801 16
	JP 11265067	A2	19990928	JP 1998-270685	199809 25
	US 6180316	B1	20010130	US 1999-231762	199901 15
PRAI	JP 1998-18290	A	19980116		
	JP 1998-18291	A	19980116		
	JP 1998-270685	A	19980925		

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 930541	ICM	G03F007-039
	ICS	G03F007-004
EP 930541	ECLA	G03F007/004D; G03F007/039
US 6180316	ECLA	G03F007/004D; G03F007/039
OS	MARPAT 131:108922	
GI		



AB A radiation-sensitive resin compn. useful as a chem. amplified resist comprises (A) a polymer contg. (a) a recurring unit of the formula I (A, B = H or an acid-decomposable org. group having .ltoreq.20 C atoms which dissocs. in the presence of an acid and

produces an acidic functional group provided that either one of A and B is the acid-decomposable org. group; X, Y = H or alkyl having 1-4 C atoms; n = 0 or 1) or a recurring unit of the formula I and a recurring unit of the formula II and (b) a recurring unit which is derived from a monomer having at least two polymerizable carbon-carbon double bonds by cleavage of the carbon-carbon double bonds, wherein the monomer has, in addn. to said at least two polymerizable carbon-carbon double bonds, at least one acid-decomposable divalent group of the formula  $-CO_2C(R_1)(R_2)-$  or  $-OCOC(R_3)(R_4)-$  ( $R_1-4$  = alkyl having 1-5 C atoms), said at least two polymerizable carbon-carbon double bonds being linked via the acid-decomposable divalent group and (B) a photoacid generator.

ST chem amplified resist norbornene copolymer

IT Photoresists

(chem. amplified; contg. norbornene copolymers)

IT 102-60-3, N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine  
 1116-76-3, Trioctylamine 2842-38-8, N-Cyclohexylethanolamine  
 3033-62-3, Bis(2-dimethylaminoethyl) ether 66003-78-9,  
 Triphenylsulfonium trifluoromethanesulfonate 144317-44-2,  
 Triphenylsulfonium nonafluorobutanesulfonate 194999-85-4,  
 Bis(4-tert-butylphenyl)iodonium nonafluorobutanesulfonate  
 204315-69-5 209482-18-8 231296-54-1

(chem. amplified photoresists contg. norbornene copolymers and)

IT 231299-53-9P

(prepn. and reaction in prepg. alicyclic compd. for chem.  
 amplified photoresists contg. norbornene copolymers)

IT 3439-94-9P 7329-04-6P 7388-87-6P 41596-02-5P 46382-54-1P  
 58732-15-3P 168898-16-6P 195057-79-5P 231296-10-9P  
 231296-21-2P 231296-29-0P

(prepn. and reaction in prepg. norbornene copolymers for chem.  
 amplified photoresists)

IT 231296-14-3P 231296-17-6P 231296-19-8P **231296-23-4P**

231296-25-6P 231296-31-4P **231296-34-7P**

(prepn. and use in chem. amplified photoresists)

IT 231299-51-7P

(prepn. and use in chem. amplified photoresists contg. norbornene  
 copolymers)

IT 122752-67-4P 169228-97-1P 213901-06-5P 231296-37-0P  
 231296-39-2P 231296-41-6P 231296-42-7P 231296-44-9P  
 231296-48-3P 231296-50-7P 231296-52-9P

(prepn. and use in chem. amplified photoresists contg. norbornene  
 copolymers)

IT 97-64-3, Ethyl 2-hydroxypropionate 108-94-1, Cyclohexanone, uses  
 110-43-0, 2-Heptanone 1320-67-8, Propylene glycol monomethyl ether  
 (solvent for chem. amplified photoresists contg. norbornene  
 copolymers)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) EI Du Pont De Nemours And Company; EP 0422628 A 1991 ZCA
- (2) International Business Machines Corporation; EP 0690348 A 1996 ZCA
- (3) Japan Synthetic Rubber Co Ltd; EP 0789278 A 1997 ZCA
- (4) Li, M; JOURNAL OF IMAGING SCIENCE 1990, V34(6), P259 ZCA
- (5) The BF Goodrich Company; WO 9733198 A 1997 ZCA

IT 231296-23-4P 231296-34-7P

(prepn. and use in chem. amplified photoresists)

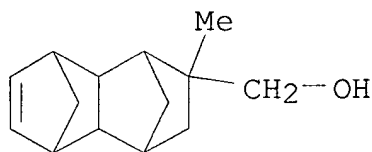
RN 231296-23-4 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with 2,5-furandione, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-1,4:5,8-dimethanonaphthalene-2-methanol and 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate (9CI) (CA INDEX NAME)

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CRN 231296-21-2

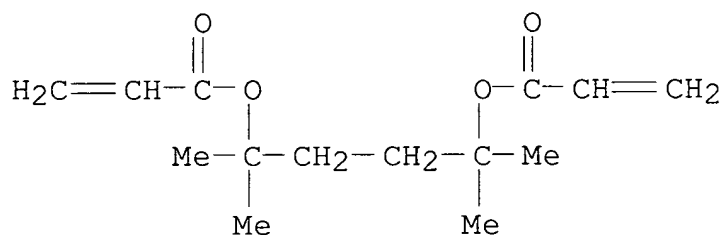
CMF C14 H20 O



CM 2

CRN 188837-15-2

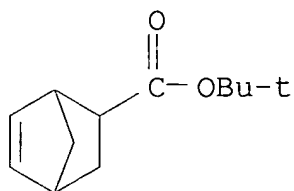
CMF C14 H22 O4



CM 3

CRN 154970-45-3

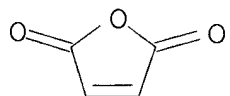
CMF C12 H18 O2



CM 4

CRN 108-31-6

CMF C4 H2 O3



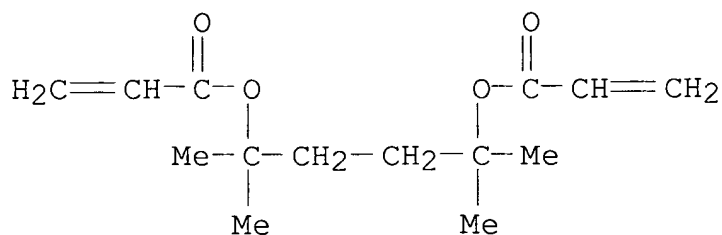
RN 231296-34-7 ZCA

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 1,1-dimethylethyl ester, polymer with 2,5-furandione, 1,2,3,4,4a,5,8,8a-octahydro-1,4:5,8-dimethanonaphthalene-2-methanol and 1,1,4,4-tetramethyl-1,4-butanediyl di-2-propenoate (9CI) (CA INDEX NAME)

CM 1

CRN 188837-15-2

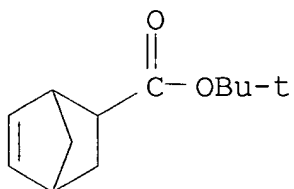
CMF C14 H22 O4



CM 2

CRN 154970-45-3

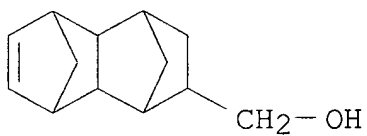
CMF C12 H18 O2



CM 3

CRN 7329-04-6

CMF C13 H18 O



CM 4

CRN 108-31-6

CMF C4 H2 O3

